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**WORLD FOOD SITUATION--
TRENDS AND PROSPECTS**

MARCH 1974

**Foreign Demand and
Competition Division**

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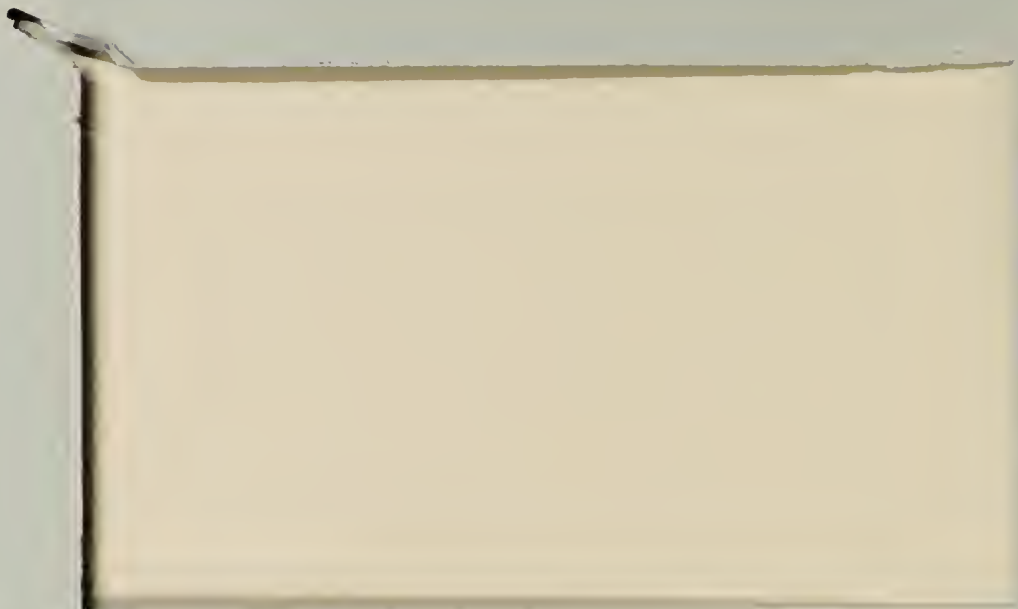
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Economic Research Service

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Warren R. Bailey
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WORLD FOOD SITUATION--
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Warren R. Bailey

Developments of the past 2 years have had major impacts on world supplies and prices of food. A combination of poor weather in several major producing areas, the unprecedented turning of the Soviet Union to world markets to meet its shortfalls, the freeing and rapid fluctuations of exchange rates, and the effects of the energy crisis have driven food prices to new heights. These developments have again raised many questions concerning the world's ability to produce and distribute enough food at reasonable prices to meet the increasing demands of growing populations and rising affluence.

This paper is based largely on materials included in the World Agricultural Situation, Economic Research Service, U.S. Department of Agriculture, December 1973, supplemented by additional tables and charts. It is intended as a preliminary report, to be followed in September 1974 by a more comprehensive study with more recent data of the world food situation.

Trends in Food Production and Population

The world's food production has grown steadily over the past two decades. ^{1/} Growth in the developed countries has roughly paralleled that in the less developed countries. The compound annual rates of growth were 2.7 percent and 3.0 percent, respectively. In the developed countries there were three occasions (1961, 1969 and 1972) in which food production fell below the previous year. Only in 1972 did production decline in the LDC's (see figure A). Both regions recovered in 1973 with preliminary estimates showing an increase of about 6 percent in each.

^{1/} The world excluding Communist Asia.

Population grew more rapidly in the less developed countries than in the developed countries over the last two decades. While population continues to grow in the developed countries, both the rate of increase and the annual increment in numbers are low and steadily declining. Growth fell below 1 percent in 1966, and it has diminished further since then. In the LDC's however, the rate of population increase and the annual increment are high, with little decline in the rate of increase. Growth now exceeds 2.5 percent per year, and the present annual increment of 45 million, nearly double the level of the early 1950's, is 5 times the current increment of the developed countries. The LDC's now account for 83 percent of the world's population increase as compared to 68 percent only a score of years earlier. Because of these trends the share of the developed countries in total population has dropped to 38 percent from 44 percent in 1954.

As a consequence of differential rates of population growth, the peoples of the developed and less developed country groups have not fared equally well from the roughly equal growth in food production. In the developed countries, production has increased much faster than population, providing for a substantial gain in production per capita. In the LDC's, population gains have absorbed nearly all of the production increase; production per capita has improved only slightly (see table 1).

Food production per capita in the developed countries has risen at a compound annual rate of 1.5 percent. Each of the several regions have shown a strong uptrend, with the index of food production per capita (1961-65=100) in each case reaching or exceeding 110 at least 3 times in the

last 20 years (see figure B). The steepest trends are shown in Eastern Europe and the USSR. Least growth has been in the United States and Canada where production until last year was restricted ^{down} by policy. Wide fluctuations in several regions (the USSR, Canada, and Oceania) reflect the effects of weather but generally do not obscure the upward trends.

Food production per capita in the LDC's has trended upward only 0.4 percent per year, and in none of the regions has the index gone as high as 110. Indeed, in Africa the index failed to reach even 105 and a general downtrend persisted after 1961, with slight upturns only in 1969 and 1971. However, because of insufficient data, many of the estimates of population and food production in African countries may not be as reliable as those in most other regions.

Figure C contrasts the total value of food production in the developed regions versus that in the less developed regions, showing the change over a 20 year period. The much higher total value of food production in the developed regions reflects the consumption of higher value commodities such as livestock products.

For the world as a whole, however, cereals continue to play a dominant role, both for direct consumption as a food and also as a feed for expanding livestock economies. Figure D shows the great difference in total grain production in the developed versus the less developed regions, comparing the two periods 1948-52 and 1966-70. In the latter period the developed countries accounted for almost two-thirds of world grain production on an area slightly less than that in the less developed regions.

Food Consumption

Despite the high prices and temporary shortages of the past year, the fundamental conditions of the world food economy have changed very little. Patterns of food consumption are largely determined by habits, tastes, and taboos which ^{change} ~~alter~~ little from year to year, and patterns of production are likewise remarkably stable. Consumers in rich countries eat better than those in poor ones largely because the economically developed countries produce more food per person than the less developed ones.

Table 2 shows regional comparisons of the number of calories per person per day from 11 food groups, as given in the Food and Agriculture Organization (FAO) food balances for 1964-66. The countries of the world have been grouped into 20 regions corresponding to those used in ERS projections of grain production and consumption. Table 3 shows the relative importance of various food groups in the average daily intake of proteins and fats as well as calories. Changes in diets have occurred since the mid-1960's, but no equally comprehensive statistics have been published for more recent years.

The developed regions average noticeably higher than the less developed in total calories and calories from sugar, vegetables, fruits, fats, and animal products. In the less developed regions, consumption per capita is high for cereals, starchy root crops and plantains, and the pulses-and-nuts group of foods. Figure E shows the percentage of calories derived from fats, carbohydrates and proteins according to the income of countries.

Because Japan is moving rapidly toward a diet more typical of the rich countries than the traditional Japanese diet, its 1964-66 figures are less representative of current conditions than such figures are for most other countries. The food balance for the Japanese fiscal year ending March 1972 showed total calories at 2,477, up 61 from 1964-66. Major gains were made by sugar (84), fats (65), meat (33), eggs (25), and milk (20), while cereals contributed 176 fewer calories directly. The latest estimate by the Foreign Agricultural Service indicates meat consumption per capita in Japan in 1972 was 31 pounds, twice the level of 1965.

Since 1964-66, every country in Western Europe has reported to FAO a decrease in calories per person per day derived directly from grain. Except in Southern Europe all countries have also reported a drop in calories from potatoes. On the other hand, nearly all have consumed more eggs per capita and, except for two slight declines (Denmark and U.K.), all have increased consumption of meat per capita. The Southern countries--Greece, Italy, Portugal, and Spain--have increased consumption of milk and cheese since 1964-66, but elsewhere in Europe changes in milk consumption have been mixed.

The importance of cereals in food consumption is indicated in two ways: For the world as a whole, they supply a trifle more than half of the calories, and they supply feedstuffs in the production of meat, milk, and eggs (see table 4). Meat consumption is increasing in all countries with trade policies and incomes that permit it (see table 5). The rising affluence of upper-income consumers around the world is pulling meat into their kitchens, from either domestic production or imports or both. To meet this rising demand for meat--including poultry--producers

must use rising quantities of concentrated feed; there is not enough grassland and roughage. The concentrated feed includes protein-rich commodities like oilcake and fishmeal but is predominantly grain. The detailed FAO data for the 1964-66 period show that per capita use of grain for food was approximately equal in the developed and less developed regions; the relatively high use of grain for food in the USSR and Eastern Europe raised the average for the developed region. In the developed countries the per capita use of cereals for feed far exceeded the amount used for food and was about 17 times the level of feed use in the LDC's (see table 6).

Since 1964-66, except perhaps in recent months, the use of cereals for feed has continued to increase. Output of grain has fluctuated with weather and government policies but has tended to increase faster than population on a world basis. Use of grain has fluctuated less than production and has shown practically the same upward trend per capita as output, the effect of stock changes being small.

In the United States the food use of grain per capita has been declining since 1909. Other developed countries have similar long-term downtrends. Among poor countries there is an opposite trend; grains are substituted for potatoes or other root crops and the total calorie intake per person is raised as income permits.

Implications for Food Reserve and Food Aid Policies

As a result of the recent world food situation, and particularly the tightness in grain supplies, there has been widespread concern about

adequacy of food supplies and the rising price levels. Government officials and heads of international organizations are urging that consideration be given to the adoption of grain reserve policies and other contingency plans to avert future shortages and unstable prices of these basic foodstuffs. ^{2/}

In recent years there has been a depletion of world grain stocks, which has had and could continue to have a significant effect on grain prices. Wheat stocks on July 1, 1973, in the four major exporting countries were at the lowest level in two decades, (see figure I) and coarse grain stocks were the lowest since 1967. Recent crop estimates indicate record harvests in many countries, including the United States and the Soviet Union, although it is unlikely that stocks will be immediately rebuilt. Thus, world grain supplies will be especially dependent on current and upcoming harvests, which could present a precarious situation if there are crop failures in a few key countries.

^{2/} The price movements since 1948 for wheat, corn and rice, as well as soybeans and cotton, are shown in Figure F. One characteristic of the price movements of these commodities was the instability of prices during the 1948-55 and 1972-73 periods, with relative stability during the intervening years, particularly for wheat and corn. Table 7 and Figure G show world wheat imports by region. The developed countries contributed about one-third of the 1963-74 growth in world wheat imports and the developing countries about two-thirds. The Central plan countries contributed practically nothing to the trend growth. The USSR, however, was responsible for about 85 percent of the fluctuations in world wheat imports. Figure H (also table 7) shows a regional breakdown of wheat exports. The United States and Canada have accounted for a major proportion (92 percent) of the fluctuation in world wheat exports since 1963, primarily because of their reserve grain stocks.

In the past, there have been adequate reserves in the United States to meet almost any food shortage. Grain stocks were accumulated as a result of farm programs designed to raise farm incomes. *by withdrawing supplies from the market* Public Law 480 was enacted to aid needy countries, while at the same time reduce *the cost of storing* ~~expensive~~ surpluses. Since 1954 the United States has shipped some \$25 billion of agricultural commodities under long term concessional credit arrangements or outright grants. With the depletion of farm surpluses and stocks in the United States and the change in domestic farm legislation to orient supply to market conditions, *there may be a change in the role of the United States as being the world's residual supplier of agricultural commodities.* Thus, the future mechanism for aiding food deficit countries is still uncertain, although the United States is promising to meet its commitment to help needy people in developing countries. At the same time, countries *which* are commercial importers of U.S. agricultural commodities are being alerted that they may have to bear more of the burden of stockholding to meet their own needs.

To deal with the problems of shortages of grain supplies in the future, the Director General of the Food and Agriculture Organization proposed a new initiative for international action to assure an adequate food supply.

The biennial FAO conference in Rome in November 1973 adopted a resolution endorsing the basic principles and objectives of a world food security policy. The resolution states that "the entire international community" has a common responsibility to assure that world food supplies are adequate at all times in order to keep pace with growing needs and to offset fluctuations in production and prices. An agreed upon text for the international undertaking on world food security is being prepared and will be offered for adoption by governments at "the earliest possible date." If properly implemented by all major exporting and importing countries, including the Soviet Union, the FAO proposal could have the merit of reducing the probability of future acute food shortages and moderating price instability, while at the same time not overburdening a few national governments with the cost of holding reserves for the whole world.

The FAO conference also unanimously endorsed a proposal for a World Food Conference to be held in Rome in November 1974 under the auspices of the United Nations. Secretary of State Kissinger, in his speech to the UN General Assembly on September 24, 1973, had proposed such a conference "to discuss ways to maintain adequate food supplies and to harness the efforts of all nations to meet the hunger and malnutrition resulting from natural disasters." The agenda for the November Conference is still under discussion but the five items of a provisional agenda discussed at the first preparatory committee meeting in February 1974 give some indications of the topics likely to be discussed at the November Conference:

(1) The present food situation and dimension and causes of hunger and malnutrition in the world;

(2) the magnitude of the food problem in the future and possible approaches to a solution;

(3) measures for increasing food production and consumption in developing countries;

(4) strengthening world food security through coordinated stock-holding, emergency relief and food aid; and

(5) international trade and international agricultural adjustment.

Outlook

World Fertilizer Situation--The outlook for world food production has been affected by the energy crisis, particularly as reflected in the

prospects for nitrogen fertilizer supplies. Production of phosphate and potassium fertilizers requires large amounts of energy. In addition, nitrogen production utilizes large amounts of natural gas and petroleum products directly as raw materials.

The present world fertilizer shortage has been brewing since mid-1971. Prices for some nitrogen fertilizers have increased more than 200 percent since 1971. The overcapacity of the late 1960's discouraged new investment in nitrogen fertilizer plants. Furthermore, in many of the plants that were begun, construction delays postponed startup dates, and operating difficulties plagued many newly completed plants..

Since 1960, world production and consumption of nitrogen fertilizers have increased about 300 percent. In 1973, world nitrogen production reached an estimated 42 million tons (see table 8). West Europe and Japan are the major exporting regions (see table 9). Estimates for 1974 indicate that world nitrogen production will climb to 46 million tons (up 9 percent) while demand will reach 45 million tons (up 11 percent). The expected surplus (production minus quantities demanded) is about 2 percent of estimated demand and is low by historic standards. However, market imperfections, logistical problems and other customary problems and delays may cause severe shortages in some areas. In the developing regions about a third of their nitrogen will have to be supplied with imports.

Production and consumption of phosphate fertilizer have increased by about 150 percent since 1960, considerably less than nitrogen. World phosphate production in 1973 reached an estimated 26 million tons

P_2O_5 (see table 10) Estimates for 1974 indicate production of 29 million tons (up 10 percent) and demand of almost 28 million tons (up 7 percent). The expected world surplus is only 4 percent of estimated demand which is low by past standards but higher than in 1973. The largest phosphate deficit regions include Latin America and Developing Asia. North America, Developing Africa, East Europe, and the USSR are the regions where production significantly exceeds domestic demand.

Tight supplies will keep considerable upward pressure on phosphate fertilizer prices. For diammonium phosphate, the price has more than doubled since 1971.

World production of potassium fertilizers increased 147 percent from 1960 to 1973 (see table 11). In 1974, production is estimated to increase to 24 million tons (up 2 percent) and demand to a little over 21 million tons (up 5 percent). Because world potash production is concentrated in only a few locations, several regions show substantial surpluses while others show large deficits. Thus, there is considerable international potash trade. However, with a substantial production surplus, prices are not high and few countries find purchasing potash a formidable barrier.

The impact of the current fertilizer shortage may be more severe in some of the less developed regions than in developed countries because fertilizer imports account for a major portion of the fertilizer supply in the LDC's. Also, world market equilibrium is being reached at higher price levels which will strain already depleted foreign exchange reserves in some LDC's. The wheat and rice varieties that

characterize the Green Revolution generally produce little more than traditional varieties unless fertilized and irrigated.

The tight world nitrogen situation may prevail into the late 1970's (see table 12). The high prices, however, may spur increased production capacity. The People's Republic of China, for example, reportedly is embarking on a major expansion of nitrogen capacity. Several recently announced large plants in Canada, Mexico, and the Caribbean should add to nitrogen supplies in North America. Also, some of the Mideast oil producing countries have been moving into nitrogen fertilizer production in recent years, a trend that is likely to continue.

The outlook for the 1980 world phosphate situation is better than that for nitrogen. Current capacity plus planned additions should be sufficient to meet anticipated demand (see table 13). The principal deficit areas are Developing Asia and Latin America. Developing Africa should have a substantial surplus from high levels of production in North Africa. North America will likely remain the world's largest exporter of phosphate fertilizer materials and a principal source of supply for the deficit developing regions.

World demand for potash fertilizer is expected to range from 26 to almost 31 million tons by 1980 (see table 14). Using the midpoint of this range as the most likely estimate of demand, current potash capacity will not be sufficient to satisfy demand in 1980. Although no planned additions have been announced, Canadian producers have indicated that they will expand as needed to satisfy world demand. With virtually unlimited reserves, Canada will remain the dominant exporter of potash.

Grain and soybean projections to 1985--Levels of demand, production, and trade of food grains and coarse grains have been projected to 1985 ^{3/} (see tables 15-19). Two alternative levels are suggested, both of which project steady long-term growth in world demand for livestock feeds. The first is based upon the conservative assumption of continued growth in import demand, constrained by high prices and policies of major importing countries to attain self-sufficiency--essentially a return to trends established prior to 1972. The second is a high-demand alternative which assumes that animal production will be encouraged in grain-importing countries, leading to heightened demand for feedstuffs. 2

^{3/} The inputs to this analysis were growth rates for population and income, demand and supply price elasticities, and assumptions about basic underlying economic trends and policy constraints. The medium variant of the UN population projections is used while the world economy is posited to continue to grow at the rapid rate of recent decades. The analysis assumes an annual rate of price inflation for the United States of 3 percent, and nearly 4 percent for the rest of the world. Normal weather (i.e., average conditions which cancel out both unusually poor or good years) is assumed. An attempt is made to take into account trends in tastes and preferences in consumption, such as increasing desire for livestock products as people's incomes rise; changes in resource constraints; and trends in yield growth which try to capture the effect so far of the "green revolution." Unless otherwise specified, an essential continuity in present policies guiding domestic production, consumption, and international trade is assumed.

The conservative assumptions of Alternative I imply that the world's capacity for production of cereals will increase faster than consumption and that there could be ^{an involuntary} a rebuilding of grain stocks, downward pressure on prices, or possibly programs to restrict production in the major exporting countries, or some combination of these. Under this Alternative the enlarged European Community would be expected to approach self-sufficiency in grains as would Eastern Europe, and the USSR, even though they are currently substantial importers of feed grains. The continuation of policies to maintain high grain prices in the EC-9 would encourage feed manufacturers there to substitute protein supplements and other non-grain feeds for grain. This in turn would substantially increase the demand for soybeans since fishmeal production, at best, probably will continue to expand at considerably less than the rate of the last decade. China would likely import wheat and export rice. Japan would remain the largest single import market for wheat and coarse grains.

The high demand Alternative II projection attempts to anticipate what would happen should world demand grow more rapidly than suggested under Alternative I by incorporating the following additional assumptions:

- The USSR and Eastern Europe attempt to increase livestock production and consumption at a faster rate of growth even if it means importing grain and high overall levels of trade with the western world;
- the People's Republic of China becomes more trade oriented and imports more grain to improve city diets;
- the enlarged European community finds it advantageous not to pursue as strongly its self-sufficiency policy by setting lower price targets for production, thus permitting continued imports of grain;

- the livestock economies, particularly poultry, of the developing world grow faster, either in countries with enhanced petroleum revenues, or in countries with unexpectedly higher rates of economic growth; and
- fishmeal production stagnates at the 1969-71 level.

The higher demand for livestock products under Alternative II should translate essentially into a substantial increase in demand for coarse grains and oilseed meal with some impact on the demand for wheat. Higher feed prices would encourage more feeding of wheat in the developed countries, particularly Western Europe where wheat competes well with barley for feed use. The projections suggest that the United States could meet nearly all the increase import demand for coarse grains, with U.S. export of feed grains reaching 56 million metric tons or about 25 million tons higher than under Alternative I. The largest part of the growth in import demand for oilseed meal would be expected to be supplied by the United States, although other traditional suppliers, such as Brazil, would likely play a large part. Under Alternative II, U.S. soybean exports are projected at 30.6 million tons, 4.8 million tons more than the Alternative I projection of 25.8 million tons shown in table 20.

Under both alternatives, the consumption and trade of wheat and rice should grow less rapidly than coarse grains because of the increasing need of feed for expanding livestock and poultry production. The analysis also suggests that countries in the developed and centrally planned parts of the world will continue to be the major producers and consumers of wheat and coarse grains. The developed exporting countries will continue to supply the less developed importing countries with grain. The developed

importing countries will increase their feed grain imports to fuel growing livestock economies. Most of the less developed countries will import more wheat because their limited foreign exchange resources will cause them to give food grains priority over feed grains. However, some with abundant foreign exchange could show a rapid growth in imports of feed grains particularly under Alternative II. Projected production and trade of the less developed countries should permit their per capita consumption of grains to increase slightly over the base period. But any larger increase will most likely have to come from greater domestic production rather than from larger imports. Korea and Taiwan, however, are examples of areas where little wheat is grown, but where significant growth in imports of wheat is projected.

U.S. production potential--Both alternative projections described above anticipate that the United States would supply by far the largest share of ^{the} increase ⁱⁿ import demand for coarse grains, and an important share of increased import demand for wheat. A recent ERS study indicates that American farmers have the potential to substantially increase their output of major agricultural products to levels consistent with the projections. The study does not attempt to predict whether the potential will be achieved, but is intended as a profile of what might happen under a specified set of conditions, namely:

- That farm product prices in the future are favorable for increased production;
- that there are no restrictions on the use of land;
- that supplies of inputs are adequate, and that they are made available to producers at relatively favorable prices;

- that growing conditions are normal; and
- that new agricultural science and technology will continue to come on stream at about the same rate as in past years, [with neither new scientific breakthroughs nor drying up of the fountain of new knowledge.]

(4)

Under these conditions, a 50-percent increase in feed grain production, a 40 percent increase in soybean output, and a doubling of rice production over 1973 could be achieved by 1985 (table 21). Part of the increase would come from expanded use of cropland, primarily from acreage formerly diverted under Federal supply management programs and from cropland pasture. But most increases in output would be expected to come from higher yields. With additional incentives, even more land could be brought into production, and yields could conceivably scale higher, even with present technology. A more detailed analysis of U.S. production potential is contained in the December 1973 issue of the ERS Farm Index, from which Figures J-N are taken.

Table 2. Calories per person per day from 11 food groups, 1964-66 average

Region	Total	Cereals	Starchy crops	Sugar	Pulses, nuts & cocoa	Vegetable	Fruit	Meat	Eggs	Fish	Milk	Fats & oils
DEVELOPED												
United States	3,156	649	95	513	103	73	101	598	71	26	397	530
Canada	3,142	670	155	520	73	62	101	622	57	23	378	481
Australia & N. Zealand	3,192	821	101	550	61	47	102	655	52	23	403	377
U.S.S.R.	3,182	1,544	265	412	60	41	27	240	27	21	252	293
EC-9	3,111	878	179	391	68	59	109	474	50	30	305	568
Eastern Europe	3,080	1,498	183	307	59	49	58	314	31	13	189	379
Japan	2,416	1,397	134	197	146	90	53	53	38	85	62	174
South Africa	2,732	1,583	33	403	55	14	37	254	11	28	147	167
Other Western Europe	2,897	978	191	304	103	69	126	288	38	50	267	483
AVERAGE	3,043	1,127	175	388	82	59	76	371	44	32	270	419
LESS DEVELOPED												
Argentina	2,885	999	180	378	28	30	88	614	24	12	206	326
Mexico & Cent. America	2,425	1,197	107	388	188	14	82	131	16	11	104	187
Other South America	2,276	898	291	363	80	23	62	203	13	21	142	180
West Asia	2,316	1,480	41	187	91	39	113	78	7	4	91	185
China	2,045	1,383	224	35	134	33	6	134	12	14	5	65
Brazil	2,541	861	410	401	312	11	48	203	18	13	135	129
East Asia & Pacific	1,969	1,271	245	99	107	27	31	58	7	31	8	85
North Africa	2,290	1,461	104	198	72	43	67	69	5	6	78	187
South Asia	1,975	1,300	29	192	176	35	26	8	1	5	89	114
Southeast Asia	2,121	1,589	70	84	78	29	58	77	8	39	18	71
Africa South of Sahara	2,154	1,109	568	53	180	13	18	61	3	13	32	104
AVERAGE	2,097	1,300	191	135	146	30	30	89	8	13	50	105
WORLD	2,386	1,247	186	212	127	39	44	175	19	19	117	201

Table 3 - Relative importance of various food groups in average world daily per caput intake
(food balance sheets 1964-66)

	Calories		Proteins		Fats	
	Number	Percent	Grammes	Percent	Grammes	Percent
Cereals	1 245	52.4	31.1	47.4	5.1	9.3
Wheat	441	18.6	13.3	20.3	1.5	2.7
Rice	459	19.3	8.5	13.0	1.0	1.8
Maize	147	6.2	3.6	5.5	1.0	1.8
Millet and sorghum	119	5.0	3.5	5.3	1.2	2.2
Others	76	3.2	2.1	3.2	0.4	0.7
Roots and tubers	184	7.8	2.8	4.3	0.4	0.7
Sugar and sugar products	210	8.8	0.1	0.2	-	-
Pulses, nuts and oilseeds	121	5.1	7.9	12.0	3.6	6.5
Vegetables	36	1.5	2.2	3.4	0.3	0.5
Fruits	47	2.0	0.6	0.9	0.3	0.5
Total, animal products	322	13.6	20.7	31.5	22.4	40.8
Meat	168	7.1	9.2	14.0	14.3	26.0
Eggs	18	0.8	1.4	2.1	1.3	2.4
Fish	19	0.8	3.0	4.6	0.6	1.1
Milk	117	4.9	7.1	10.8	6.2	11.3
Fats and oils	199	8.4	0.1	0.2	22.5	40.9
Vegetable oils	127	5.3	-	-	14.4	26.2
Animal fats	72	3.1	0.1	0.2	8.1	14.7
Total	2 374	100.0	65.6	100.0	55.0	100.0
Animal origin	396	16.7	20.8	31.7	30.5	55.5

Source: United Nations, Food and Agriculture Organization. Agricultural Commodity Projections, 1970-1980, 1971, p. 49.

Table 4.-Use of grain for feed and output of animal products, per capita, 1964-66 average

Region	Grain used for feed, per capita	Output per capita		
		Meat	Eggs	Milk
-- Kilograms per year --				
DEVELOPED				
United States	590	102	20.3	287
Canada	669	90	14.8	406
Australia & New Zealand	217	192	14.5	932
U.S.S.R.	169	38	7.1	258
EC-9	238	62	13.0	327
Eastern Europe	283	50	9.2	236
Japan	62	12	10.5	32
South Africa	81	43	3.7	132
Other W. Europe	179	38	9.5	238
TOTAL	277	58	12.0	264
LESS DEVELOPED				
Argentina	173	135	7.2	216
Mexico & Cent. America	36	25	4.6	57
Other S. America	15	36	3.6	77
West Asia	60	14	2.4	82
China	15	17	3.7	6
Brazil	88	33	5.5	84
East Asia & Pacific	5	8	1.9	1
North Africa	19	16	1.7	55
South Asia	2	2	.3	54
Southeast Asia	3	11	2.4	5
Africa So. of Sahara	2	12	1.1	19
TOTAL	16	14	2.3	33
WORLD	95	27	5.2	103

Table 5. Total meat: ^{1/} Per capita consumption in specified countries, average 1964-68, annual 1968-72

Continent and country	Average 1964-68	1968	1969	1970	1971 ^{2/}	1972 ^{2/}
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
North America:						
Canada	152	159	159	160	164	163 ✓
Costa Rica	31	24	27	30	33	30
Dominican Republic	20	19	19	20	21	22
El Salvador	25	22	21	20	18	18
Guatemala	22	24	21	21	21	20
Honduras	21	22	19	18	21	21
Mexico	35	36	36	37	37	35
Nicaragua	43	45	47	48	50	49
Panama	54	52	57	58	63	69
United States	174	183	182	186	192	188 ✓
South America:						
Argentina	195	218	228	205	175	167 ✓
Brazil	54	56	56	57	54	56
Chile	54	61	58	59	61	48
Colombia	50	49	52	53	55	49
Paraguay	97	95	89	91	72	70
Peru	34	32	29	31	30	30
Uruguay	228	211	170	197	157	157 ✓
Venezuela	52	52	57	54	53	51
Europe:						
Western:						
EC:						
Belgium-Luxembourg	123	131	133	138	140	149
Denmark	130	123	124	135	126	127
France	134	138	136	138	138	140
Germany, West	125	133	133	140	146	147
Ireland	116	117	122	130	136	137
Italy	64	70	70	72	75	75
Netherlands	99	105	100	104	111	106
United Kingdom	139	138	138	137	143	138
EC average	115	121	119	122	127	126
Austria	123	127	132	133	136	138
Finland	82	81	88	92	95	100
Greece	67	73	79	86	87	88
Norway	81	83	83	83	86	88
Portugal	39	43	47	45	48	53
Spain	56	63	64	69	64	71
Sweden	101	105	103	105	104	97
Switzerland	118	122	125	130	133	138 ✓
Eastern:						
Bulgaria	81	87	79	76	80	89
Czechoslovakia	107	114	112	117	122	131 ✓
Hungary	86	91	85	93	92	98
Poland	86	92	92	91	97	98
Yugoslavia	65	72	63	68	78	77
USSR	74	82	81	84	89	90
Africa:						
South Africa, Republic of ...	74	71	77	81	86	78
Asia:						
China, Taiwan	43	48	53	53	52	54
Iran	19	20	21	19	18	19
Israel	42	47	46	45	45	28
Japan	18	20	21	24	28	31
Philippines	27	28	30	27	27	27
Turkey	32	31	33	33	31	32
Oceania:						
Australia 3/	204	202	209	199	215	222 ✓
New Zealand 3/	220	219	241	218	214	171 ✓

1/ Carcass weight basis; includes horse meat.

2/ Preliminary.

3/ Year ending June 30.

Source: Foreign Agriculture Circular, FLM - 1-74.

Table 6. Grain used, total and per capita, 1964-66 average

Region	Total grain used			Population:	Grain used per capita		
	Total	Food	Feed		Total	Food	Feed
	-- Million	metric tons	--	Millions	-- Kilograms	per year	--
DEVELOPED							
United States	143.0	17.5	113.1	191.7	746	91	590
Canada	17.8	1.8	13.2	19.7	906	92	669
Australia & New Zealand	6.1	1.6	3.1	14.1	428	113	217
U.S.S.R.	128.3	50.0	39.0	230.6	556	217	169
EC-9 1/	99.4	29.6	58.6	246.4	404	120	238
Eastern Europe	70.0	25.1	34.3	121.4	576	207	283
Japan 1/	23.7	15.4	6.1	98.2	241	157	62
South Africa	5.9	3.6	1.6	20.2	294	178	81
Other W. Europe 1/	27.9	10.1	14.1	78.8	354	128	179
TOTAL	522.1	154.8	283.1	1,021.1	511	152	277
LESS DEVELOPED							
Argentina	8.7	3.1	3.9	22.5	388	138	173
Mexico & Cent. America	15.7	11.7	2.8	77.9	204	151	36
Other S. America	9.1	7.1	.9	62.8	144	112	15
West Asia	29.8	18.9	6.2	102.3	292	185	60
China	150.8	125.4	11.2	764.1	197	164	15
Brazil	19.5	9.9	7.1	80.8	242	123	88
East Asia & Pacific	33.2	30.4	1.0	206.5	161	147	5
North Africa	16.3	13.3	1.4	74.3	219	178	19
South Asia	103.3	93.4	1.1	621.2	166	150	2
Southeast Asia	19.5	16.1	.3	98.9	197	163	3
Africa So. of Sahara	32.8	28.9	.5	217.3	151	133	2
TOTAL	438.9	358.2	36.4	2,328.6	188	154	16
WORLD	961.0	513.0	319.5	3,349.7	287	153	95

1/ The population figures shown were taken from OECD Food Consumption Statistics and generally refer to December 31

Source: OECD Food Consumption Statistics 1960-68 and FAO Food Balances 1964-66, with adjustments for grains omitted by OECD and FAO. Rice included as milled rice.

Table 7.—World trade in wheat and flour (grain equivalent) fiscal years 1963-74 1/

Region and country	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	Preliminary 1973	Forecast 1974
Million metric tons												
Exports												
United States	17.3	23.1	19.3	23.4	20.0	20.2	14.7	16.5	19.8	16.9	32.0	31.0 ⁷
Canada	9.0	15.0	11.9	14.9	14.8	8.9	6.7	8.9	11.5	13.7	15.7	13.7
Australia	5.0	7.8	6.4	5.7	6.9	7.0	5.3	7.4	9.3	8.4	5.4	6.8
Argentina	1.8	2.8	11.3	7.8	3.1	1.4	2.7	2.1	1.7	1.2	3.3	1.3
Sub total	33.1	48.7	41.9	51.8	44.8	37.5	31.4	34.9	42.3	40.2	36.4	52.8
West. Europe	4.5	4.8	6.8	6.9	5.8	7.7	9.2	11.1	6.4	8.6	12.0	12.0
East Europe	0.0	0.3	0.3	0.9	1.7	2.3	2.0	1.3	0.1	0.2	0.5	0.7
USSR	5.3	2.7	2.2	2.6	4.4	5.3	5.8	6.4	7.1	5.5	2.5	4.0
Others	0.5	0.9	1.3	1.0	0.7	0.7	0.8	0.8	0.4	1.0	2.1	0.8
World total	43.4	57.4	52.5	63.2	57.4	53.5	49.2	54.5	56.3	55.5	73.5	70.3
Imports												
Japan	2.7	3.9	3.5	3.5	4.3	4.0	4.2	4.4	4.8	5.0	5.5	5.5
West. Europe	9.8	10.9	11.1	11.7	10.9	10.3	12.8	12.7	13.8	12.2	13.0	12.5
Developed	12.5	14.8	14.6	15.2	15.2	14.3	17.0	17.1	18.6	17.2	18.5	19.0
East Europe	5.9	6.0	7.4	7.2	5.4	4.9	4.3	4.7	6.5	4.8	4.7	4.0
USSR	0.0	9.7	2.2	8.5	3.1	1.5	0.2	1.1	0.3	3.4	14.9	5.5
China, P. Rep.	4.9	5.2	5.0	6.3	5.0	4.2	3.5	5.1	3.5	3.0	5.4	6.5
Central plan	10.8	20.9	14.6	22.0	13.5	10.6	8.0	10.9	10.3	11.2	25.0	16.0
Africa 2/	4.2	2.8	3.3	3.8	6.0	5.6	3.6	3.7	5.6	5.2	4.9	6.4
Latin America 3/	4.0	3.0	3.7	3.9	4.6	5.1	4.3	3.9	3.7	4.3	6.3	6.1
West Asia 4/	2.0	1.4	1.7	1.2	1.8	1.6	1.7	2.3	3.5	3.8	1.7	3.6
South Asia 5/	5.8	6.2	8.8	8.7	9.1	9.3	5.4	5.4	4.7	4.2	6.4	8.3
East Asia 6/	2.1	1.7	1.2	1.4	1.3	1.8	2.0	2.7	3.0	3.1	3.0	3.3
Others	2.0	6.6	4.6	7.0	5.9	5.2	7.2	8.5	6.9	6.5	7.7	7.6
Less developed	20.1	21.7	23.3	26.0	28.7	28.6	24.2	26.5	27.4	27.1	30.0	35.3
World total	43.4	57.4	52.5	63.2	57.4	53.5	49.2	54.5	56.3	55.5	73.5	70.3

1/ Data include intra-EC-9 trade, but exclude products other than flour in grain equivalent; U.S. data also adjusted for transshipments through Canada.

2/ Algeria, Egypt, Libya, Morocco, Nigeria, South Africa, Sudan and Tunisia.

3/ Mexico, Brazil, Chile, Colombia, Peru and Venezuela.

4/ Iran, Iraq, Israel, Jordan, Lebanon, Saudi Arabia, Syria, and Turkey.

5/ Bangladesh, Ceylon, India, Indonesia and Pakistan.

6/ Philippines, Taiwan, and South Korea.

Source: World Wheat Situation WS-226, Nov. 1973 ERS, USDA.

Table 8.--World nitrogen fertilizer production and consumption, 1960-73

Year	Production
	<u>1,000 short tons</u>
1960	11,000
1961	12,000
1962	13,100
1963	14,500
1964	16,400
1965	18,600
1966	21,100
1967	24,700
1968	28,200
1969	31,300
1970	33,300
1971	36,300
1972	38,700
1973 <u>1/</u>	42,200

1/ Estimated.

Source: FAO Annual Fertilizer Review, 1963 for years 1960-63; 1964 for 1964; 1965 for 1965; 1966 for 1966; 1972 for 1967-72; unpublished TVA data for 1973.

Table 9.--Net nitrogen fertilizer trade balance, by region, 1967-1972 1/

Region	1967	1968	1969	1970	1971	1972
	<u>1,000 short tons</u>					
North America	260	570	1,220	920	630	640
West Europe	2,010	1,980	2,280	1,810	1,730	1,470
East Europe & USSR	-100	10	90	240	440	830
Japan	1,030	1,150	980	1,360	1,560	1,400
Other developed nations <u>2/</u>	-100	-130	-120	-10	0	-120
Developed regions	3,100	3,580	4,450	4,320	4,360	4,220
Latin America	-370	-520	-560	-530	-650	-690
Developing Africa	-320	-420	-430	-440	-430	-600
Developing Asia	-1,330	-1,880	-1,720	-1,620	-1,190	-1,310
Developing regions <u>3/</u>	-1,920	-2,820	-2,710	-2,590	-2,270	-2,610
Other Asia <u>4/</u>	-1,210	-810	-1,430	-1,600	-1,900	-1,700

1/ Positive numbers imply net exports, negative numbers imply net imports.

2/ Includes South Africa, Israel and, Oceania.

3/ Excludes Other Asia.

4/ Includes PRC, Taiwan, North Vietnam, North Korea, and Mongolia.

Source: Tennessee Valley Authority, World Fertilizer Market Review and Outlook, Muscle Shoals, Ala., forthcoming.

Table 10.--Phosphate Fertilizer production and consumption, world 1960-73

Year	Production
	-- 1,000 short tons P_2O_5 ----
1960.....	10,740
1961.....	11,130
1962.....	11,440
1963.....	12,200
1964.....	13,740
1965.....	15,260
1966.....	16,630
1967.....	18,780
1968.....	19,870
1969.....	20,490
1970.....	21,260
1971.....	22,970
1972.....	24,810
1973 <u>1/</u>	26,130

1/ Estimated.

Source: FAO Annual Fertilizer Review, 1963 for years 1960-63, 1964 for 1964, 1965 for 1965, 1966 for 1966, 1972 for 1967-72; unpublished TVA data for 1973.

Table 11.-- Potash fertilizer production and consumption, world 1960-1973

Year	Production
	----1,000 short tons K_2O ----
1960.....	9,600
1961.....	9,670
1962.....	10,320
1963.....	10,820
1964.....	11,900
1965.....	13,370
1966.....	15,180
1967.....	16,000
1968.....	16,860
1969.....	17,510
1970.....	18,430
1971.....	19,520
1972.....	21,210
1973 <u>1/</u>	23,700

1/ Estimated.

Source: FAO Annual Fertilizer Review, 1963 for years 1960-63, 1964 for 1964; 1965 for 1965; 1966 for 1966; 1972 for 1967-72; unpublished TVA data for 1973.

Table 12--Estimated nitrogen fertilizer production and consumption, world, by region, 1978 and 1980

Region	1978 production capacity 1/	1978 production			1980 consumption		
		High	Low	Midpoint	High	Midpoint	Low
		2/	3/				
----- 1,000 Short Tons N -----							
North America-----	13,400	12,700	11,400	11,400	11,300	10,900	10,900
West Europe-----	12,900	12,300	11,000	10,700	10,500	10,200	10,200
East Europe and USSR-----	16,100	15,300	13,700	18,200	17,200	16,300	16,300
Japan-----	4,000	3,800	3,400	1,200	1,000	800	800
Other Developed Nations 4/-----	800	800	700	1,000	800	600	600
Developed Regions-----	47,200	44,900	40,200	42,500	40,800	38,800	38,800
Latin America-----	4,100	2,900	2,500	3,600	3,400	3,100	3,100
Developing Africa-----	1,100	800	700	1,600	1,400	1,200	1,200
Developing Asia-----	8,500	6,000	5,200	8,600	7,800	7,000	7,000
Developing Regions 5/-----	13,700	9,700	8,400	13,800	12,600	11,400	11,400
Other Asia 6/-----	2,700	2,000	1,800	8,300	7,500	6,800	6,800
World-----	63,700	56,600	50,400	64,600	60,900	57,000	57,000

1/ Known production capacity for 1978 based on current capacity plus planned additions.

2/ Based on plants in developed countries operating at 95 percent of 1978 capacity and in LDC's at 70 percent.

3/ Based on plants in developed countries operating at 85 percent of 1978 capacity and in LDC's at 60 percent.

4/ Includes South Africa, Israel, and Oceania.

5/ Excluding Other Asia.

6/ Includes PRC, Taiwan, North Korea, North Vietnam, and Mongolia.

SOURCE: Based on TVA and unpublished USDA data.

Table 13--Estimated phosphate fertilizer production and consumption, world, by regions, 1978 and 1980

Region	1978 production capacity 1/	1978 production :			1980 consumption		
		High	2/	Low	High	Midpoint	Low
		----- 1,000 short tons P ₂ O ₅ -----					
North America.....	10,280	9,900		8,930	7,200	6,700	6,200
West Europe.....	8,300	8,030		7,450	8,220	7,920	7,620
East Europe and USSR.....	10,020	9,700		9,070	8,400	8,140	7,810
Japan.....	1,050	1,000		910	1,000	810	630
Other Developed Nations 4/.....	2,370	2,340		2,130	2,790	2,140	1,490
Developed Regions.....	32,050	30,970		28,510	27,680	25,710	23,750
Latin America.....	1,950	1,470		1,320	2,730	2,540	2,360
Developing Africa.....	2,470	1,900		1,710	790	710	640
Developing Asia.....	2,160	1,630		1,450	3,190	2,770	2,350
Developing Regions 5/.....	6,590	4,680		4,480	6,700	6,020	5,340
Other Asia 6/.....	1,920	1,890		1,880	2,320	2,110	1,900
World.....	40,560	37,540		34,870	36,700	33,840	30,990

1/ Known production capacity for 1978 based on current capacity plus planned additions.

2/ Based on plants in developed countries operating at 95 percent of 1978 capacity and in LDC's at 70 percent.

3/ Based on plants in developed countries operating at 85 percent of 1978 capacity and in LDC's at 60 percent.

4/ Includes South Africa, Israel, and Oceania.

5/ Excluding Other Asia.

6/ Includes PRC, Taiwan, North Korea, North Vietnam, and Mongolia.

SOURCE: Based on TVA and unpublished USDA data.

Table 14-Estimated potash fertilizer production and consumption, world, by regions, 1978 and 1980

Region	1978 production capacity 1/	1978 production 2/	1980 consumption		
			High	Midpoint	Low
			-----1,000 Short Tons K ₂ O-----		
North America.....	10,390	9,090	6,940	6,510	6,080
West Europe.....	7,400	6,470	6,960	6,550	6,130
East Europe and USSR.....	11,200	9,800	10,680	9,870	9,060
Japan.....	0	0	970	820	670
Other Developed Nations 3/.....	820	730	600	500	420
Developed Regions.....	29,810	26,090	26,150	24,250	22,360
Latin America.....	0	0	2,270	2,040	1,820
Developing Africa.....	500	370	330	290	240
Developing Asia.....	0	0	1,390	1,290	1,190
Developing Regions 4/.....	550	370	3,980	3,620	3,250
Other Asia 5/.....	130	110	360	360	270
World.....	29,860	26,580	30,600	28,240	25,870

1/ Known production capacity for 1978 based on current capacity plus planned additions.

2/ Based on plants in developed countries operating at 95 percent of capacity and in LDC's at 70 percent.

3/ Includes South Africa, Israel, and Oceania.

4/ Excluding Other Asia.

5/ Includes PRC, Taiwan, North Korea, North Vietnam and Mongolia.

Table 15--World total: Production, disappearance and net trade of grains (wheat, coarse grains and milled rice), 1969-71 and 1985

Country and region	1969-71			1985 Alternative I			1985 Alt. II
	Prod.	Disap.	Net trade 1/	Prod.	Disap.	Net trade 1/	Net trade 1/ 2/
Million metric tons							
Developed							
United States	208.7	168.3	39.3	286.0	232.4	53.7	79.8
Canada	34.8	22.4	14.7	46.0	26.1	19.9	20.9
EC-9	93.2	110.4	-16.6	133.5	135.2	-1.7	-8.4
O.W. Europe	29.0	3.9	-5.0	37.8	44.0	-6.2	-6.7
Japan	12.7	28.2	-14.4	11.5	46.6	-35.1	-37.1
Aust. & N.Z.	14.9	6.0	10.8	22.7	8.5	14.1	14.9
South Africa	10.1	6.9	1.2	14.9	10.8	4.1	4.3
Total	403.4	376.1	30.0	552.4	503.6	48.8	67.7
Communist							
East. Europe	75.0	82.2	-7.3	102.9	104.0	-1.2	-5.2
USSR	168.8	164.9	4.0	227.3	227.6	-.3	-8.3
China	159.3	162.4	-3.1	209.7	214.0	-4.2	-5.2
Total	403.1	409.5	-6.4	539.9	545.6	-5.7	-18.7
Less developed							
Mexico & Cent. Am.	16.0	18.0	-1.8	25.3	30.2	-4.9	-5.9
Brazil	20.6	21.7	-.7	31.3	33.3	-2.0	-2.0
Argentina	19.3	10.7	8.3	25.6	12.9	12.6	13.7
O.S. America	7.6	10.8	-3.1	9.6	17.0	-6.9	-7.5
North Africa	15.0	18.3	-3.3	23.0	33.3	-10.3	-10.8
Central Africa	30.7	31.8	-1.0	40.2	44.6	-4.4	-5.4
West Asia	29.4	34.2	-5.1	36.1	47.3	-11.2	-12.7
South Asia	114.1	118.0	-4.7	180.0	188.8	-8.7	-9.7
S.E. Asia	25.6	22.0	3.6	40.8	34.6	6.1	6.1
East Asia, Pac.	31.2	38.4	-7.7	47.6	60.9	-13.2	-14.6
Total	309.5	323.9	-15.5	459.5	502.9	-42.9	-48.8
World total	1,116.0	1,109.5	8.1	1,551.8	1,552.1	.2	.2

1/ Net trade may not equal the difference between production and disappearance because of stock changes. Minus indicates net imports.

2/ Alternative II was done for coarse grains only.

Table 16.--World per capita production and disappearance of grains
(wheat, coarse grains and milled rice), 1969-71 and 1985

Country and region	1969-71		1985 Alternative I	
	Production	Disappearance	Production	Disappearance
	----- Kilograms per person -----			
Developed				
United States.....	1,005	811	1,131	919
Canada.....	1,634	1,049	1,682	954
EC-9.....	369	437	79	485
O.W. Europe.....	354	413	406	473
Japan.....	122	270	94	380
Aust. & N.Z.....	974	395	1,097	411
South Africa.....	419	286	420	304
Total.....	570	532	665	606
Communist				
East. Europe.....	597	655	718	726
U.S.S.R.	695	679	792	793
China.....	190	194	197	201
Total.....	334	340	361	365
Less developed				
Mexico & Cent. Am. :	171	179	171	204
Brazil.....	218	233	216	229
Argentina.....	798	444	865	436
O.S. America.....	105	148	84	148
North Africa.....	175	214	166	241
Central Africa.....	129	134	113	125
West				
West Asia.....	266	309	209	273
South Asia.....	159	164	169	177
S.E. Asia.....	226	194	248	210
East Asia, Pac.....	129	159	129	165
Total.....	173	181	170	186
World Total.....	301	299	309	309

Source: Computed from data in table 15.

Table 17 --Wheat: Production, consumption and trade in 1970 and projected to 1985

Region or Country	1970 Base 1/				1985 Alternative I			
	Production	Consumption	Net exports	Ex-ports	Production	Consumption	Net exports	Ex-ports
Million metric tons								
United States	40.2	22.7	18.0	18.0	49.7	28.7	21.1	21.2
Canada	14.0	4.6	11.4	11.4	19.9	4.4	15.5	15.6
Japan	.6	5.3	-4.7	0	.3	7.3	-7.0	0
European Community	36.8	40.3	-3.2	8.3	45.3	45.3	0	5.0
Other West Europe	9.8	10.6	-0.8	.6	10.7	10.9	-0.2	1.3
Eastern Europe	26.1	31.2	-5.1	.3	37.4	36.3	1.1	2.0
Soviet Union	92.8	88.2	4.6	6.2	115.0	115.0	0	3.0
China	23.8	27.7	-3.9	0	35.5	40.5	-5.0	0
Argentina	5.7	4.2	1.4	1.7	8.5	5.0	3.5	3.5
Australia & N.Z.	9.4	2.8	8.4	8.5	12.5	3.8	8.7	8.7
Subtotal	259.2	237.6	26.2	55.0	334.8	297.2	37.7	60.3
Other regions								
Developed	1.4	1.5	-0.1	--	.1	2.2	0	
Less developed	57.3	78.5	-23.3	.2	22.6	131.7	-37.7	
Subtotal	58.7	80.0	-23.4	.2	22.7	133.9	-37.7	
World total	317.9	317.6	2.8	55.2	431.0	431.1	0	

1/ 3-year average centered on 1970.
2/ May not balance because of stocks.

Table 18 Coarse grains: Production, consumption and trade in 1970 and projected to 1985

Region or Country	1970 Base 1/					1985				
	Production	Consump- tion	Net 2/ exports	Exports	Imports	Production	Consump- tion	Net exports	Exports	Imports
Alternative I										
Alternative II										
Million metric tons										
United States	163.9	143.7	20.5	20.9	0.4	232.5	202.3	30.2	30.7	0.5
Canada	20.5	17.3	3.0	3.4	.4	26.1	21.6	4.5	5.0	.5
Japan	.7	11.0	-10.2	0	10.2	.4	28.4	-28.0	0	28.0
European Community	56.4	68.5	-12.8	9.4	22.2	87.7	89.0	-1.3	1.0	2.3
Other West Europe	18.6	22.5	-3.9	.8	4.6	26.6	32.6	-6.0	.8	6.8
Eastern Europe	48.3	50.4	-2.1	1.0	3.1	65.3	67.3	-2.0	1.0	3.0
Soviet Union	75.2	76.6	-1.4	.1	1.6	110.0	110.0	0	0	0
China	71.0	71.0	0	0	0	92.0	92.0	0	0	0
Argentina	13.4	6.8	6.6	6.6	0	16.7	7.7	9.0	9.0	0
Australia & N.Z.	5.3	3.0	2.1	2.1	neg.	9.8	4.6	5.2	5.2	0
Subtotal	473.3	470.8	1.8	44.3	42.5	667.1	665.5	11.6	52.7	41.1
Other regions										
Developed	9.0	7.7	1.3	1.3	neg.	12.7	8.4	4.3	4.3	neg.
Less developed	110.1	111.4	-.7	4.2	4.8	161.9	177.8	-15.9		
Subtotal	119.1	119.1	.6	5.5	4.8	174.6	186.2	-11.6		
World total	592.4	589.9	2.4	49.8	47.3	841.7	841.7	0		

1/ 3-year average centered on 1970.
2/ May not balance because of stocks.

Table 19--Milled Rice: Production, consumption and trade in 1970 and projected to 1985

[illegible]

1/ Average of 1969/70-1971/72. Production primarily in initial calendar year is combined with trade in following calendar year to obtain consumption. Some regions do not balance because of change in stocks.

Table 20. Soybeans and oilseed meals, production, disappearance and trade in 1970 and projected to 1985

Commodity and region	1970 Base 1/			1985 Alternative I		
	Production	Disappearance	Net exports	Production	Disappearance	Net exports
<u>Million metric tons</u>						
Soybeans						
United States <u>2/</u>	31.2	21.8	11.6	58.5	32.7	25.8
United States <u>3/</u>	31.2	18.0	15.4	58.5	25.8	32.7
Canada <u>4/</u>	.3	.7	-.4	.5	1.0	-.5
EC-9 <u>4/</u>	--	7.3	-7.3	--	16.2	-16.2
Japan <u>4/</u>	.1	5/ 3.3	-3.2	--	5/ 6.4	-6.4
Brazil <u>3/</u>	2.0	.7	1.3	12.0	1.7	10.3
Oilseed meal <u>6/</u>						
United States	25.5	14.2	11.2	48.2	22.1	26.1
Canada	1.2	1.0	.2	2.6	1.6	1.0
EC-9	.4	10.8	-10.4	.6	19.8	-19.2
Japan	.1	2.8	-2.7	--	6.0	-6.0
Brazil	1.7	.7	1.0	8.5	1.3	7.2

1/ 3-year average centered on 1970.

2/ Soybeans only, meal exports are recorded as part of domestic disappearance.

3/ Soybean meal exports have been taken out of disappearance, converted to seed equivalent and added to net exports.

4/ Trade data includes the seed equivalent of meal trade.

5/ Japan's disappearance data include 0.8 million tons of soybeans used for edible purposes.

6/ Production, disappearance and trade of all oilseeds expressed in meal equivalents.

Table 21.--Harvested cropland and production, actual and potential, United States.

Crop	Harvested Cropland				Quantity : Unit	Production			
	1969-71 : Average	1972 : Actual	1973 : Actual	1985 : Potential		1969-71 : Average	1972 : Actual	1973 : Actual	1985 : Potential
	----- Million acres -----								
Feed Grains 1/ (Corn).....	100 (59)	94 (57)	102 (62)	116 (76)	Mil. tons : Bil. bu.	182 (4.8)	200 (5.6)	210 (5.8)	315 (9.1)
Wheat.....	46	47	54	62	: Bil. bu.	1.5	1.5	1.7	2.3
Soybeans.....	42	46	56	66	: Bil. bu.	1.2	1.3	1.6	2.3
Cotton.....	11	13	12	15	: Mil. bales	10.2	13.7	12.9	16.4
Seven Major Crops.....	200	200	225	258					
Other Crops..	92	90	93	92					
Total all : Crops.....	292	290	318	350					

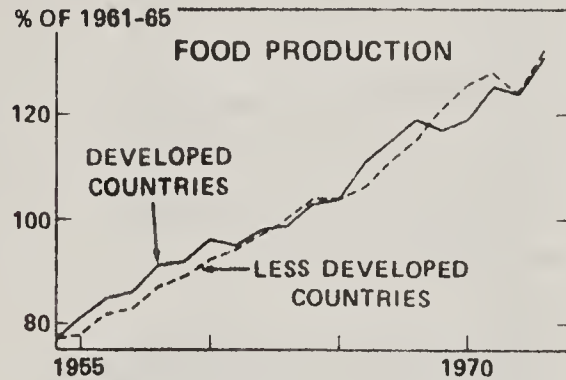
Columns may not add to totals because of rounding.

1/ Corn, barley, oats and grain sorghum.

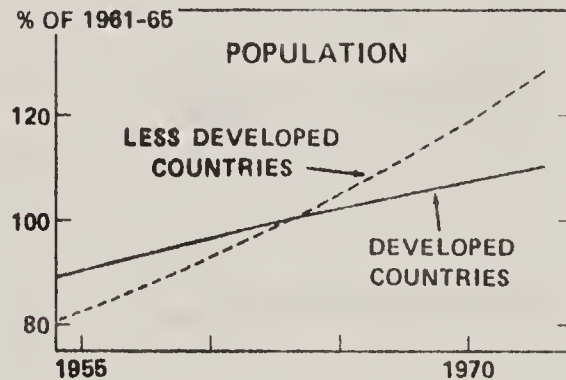
Source: Economic Research Service, Commodity Economics Division

FOOD PRODUCTION AND POPULATION DEVELOPED AND LESS DEVELOPED COUNTRIES

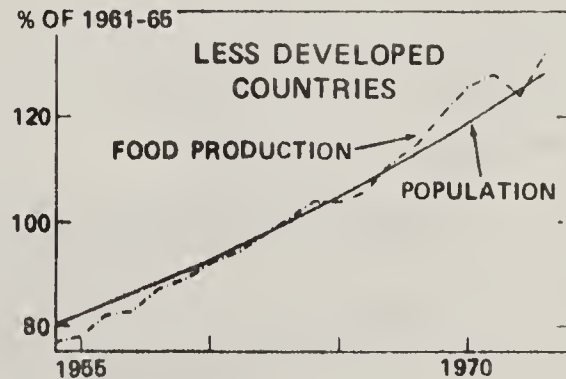
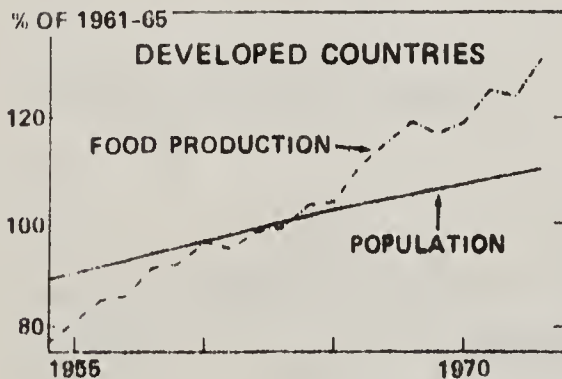
Food production has grown steadily over the past two decades. Growth in the developed countries has roughly paralleled that in the less developed countries.



Population has grown faster in the less developed countries.



Peoples of the developed and less developed country groups have not fared equally from the roughly equal growth in food production. In the developed countries production has increased much faster than population, boosting production per capita. In the LDC's population gains have absorbed nearly all of the production increase; production per capita has improved only slightly.

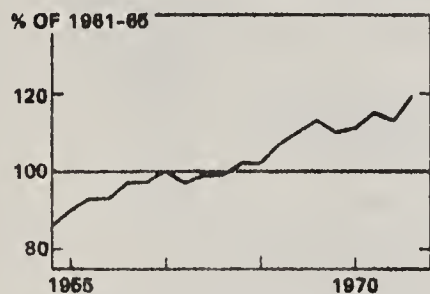


POPULATION EXCLUDES COMMUNIST ASIA

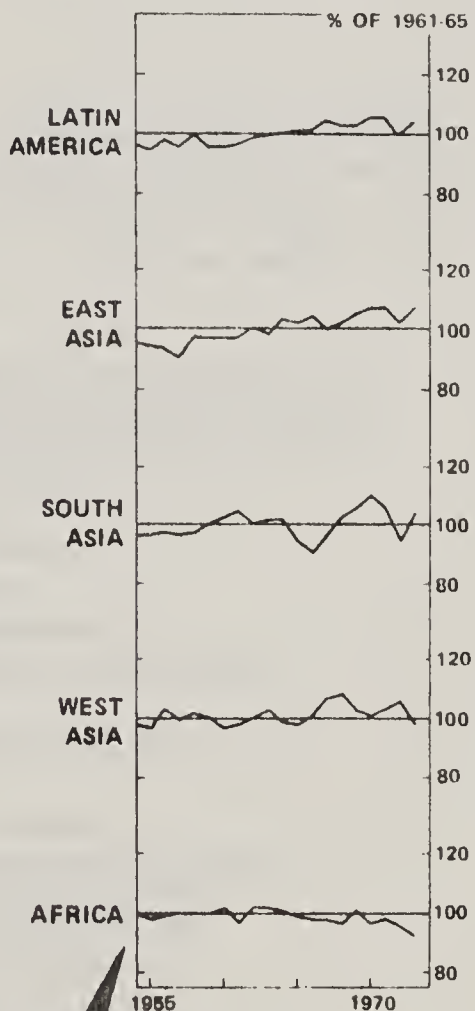
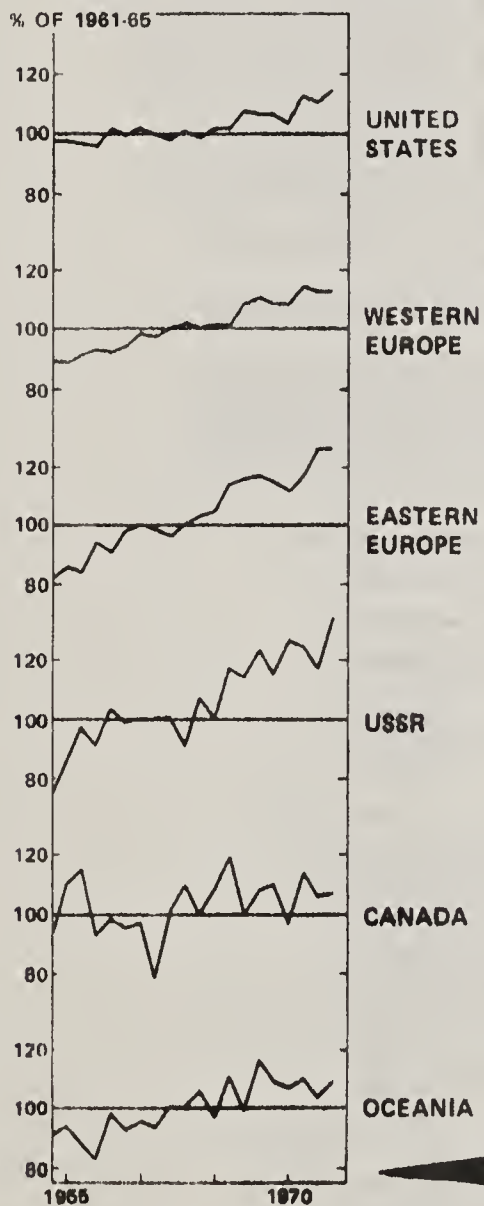
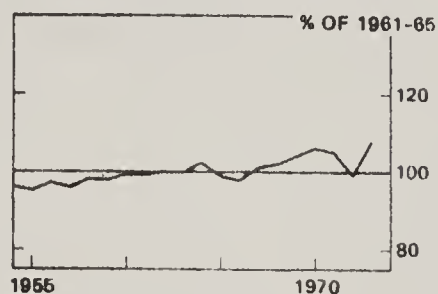
FIGURE A

FOOD PRODUCTION PER CAPITA

DEVELOPED COUNTRIES



LESS DEVELOPED COUNTRIES

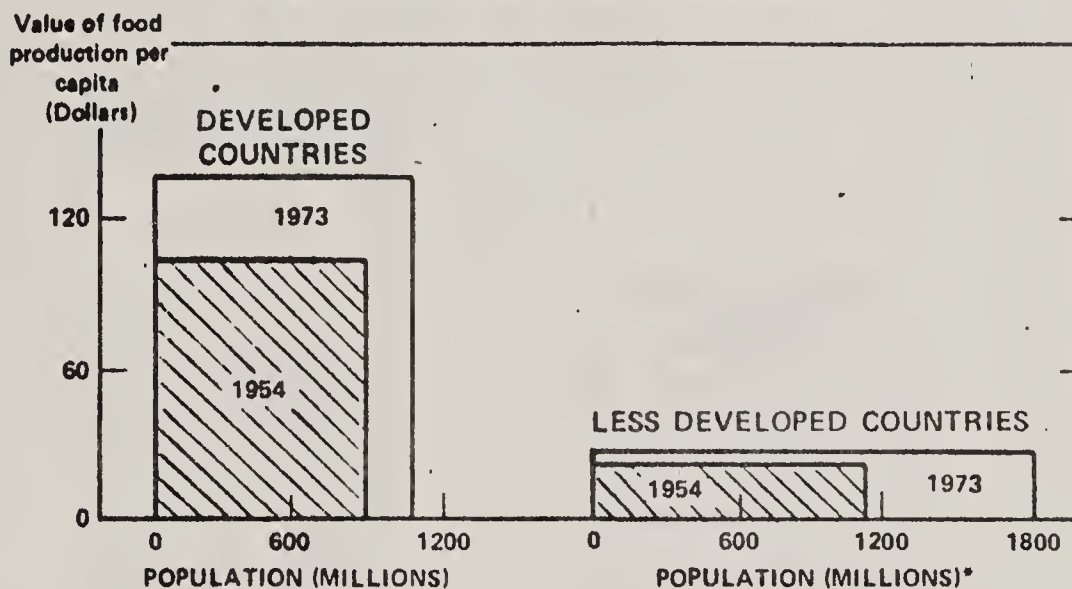


The LDC's have gained only 0.4 percent per year. In none of the regions has the index reached 110, and Africa has shown a downtrend since 1961.

Food production per capita has trended upward 1.5 percent per year in the developed countries. In each of the regions the index of food production per capita has reached or exceeded 110 at least 3 times in the 20 years.

FIGURE B

POPULATION AND FOOD PRODUCTION



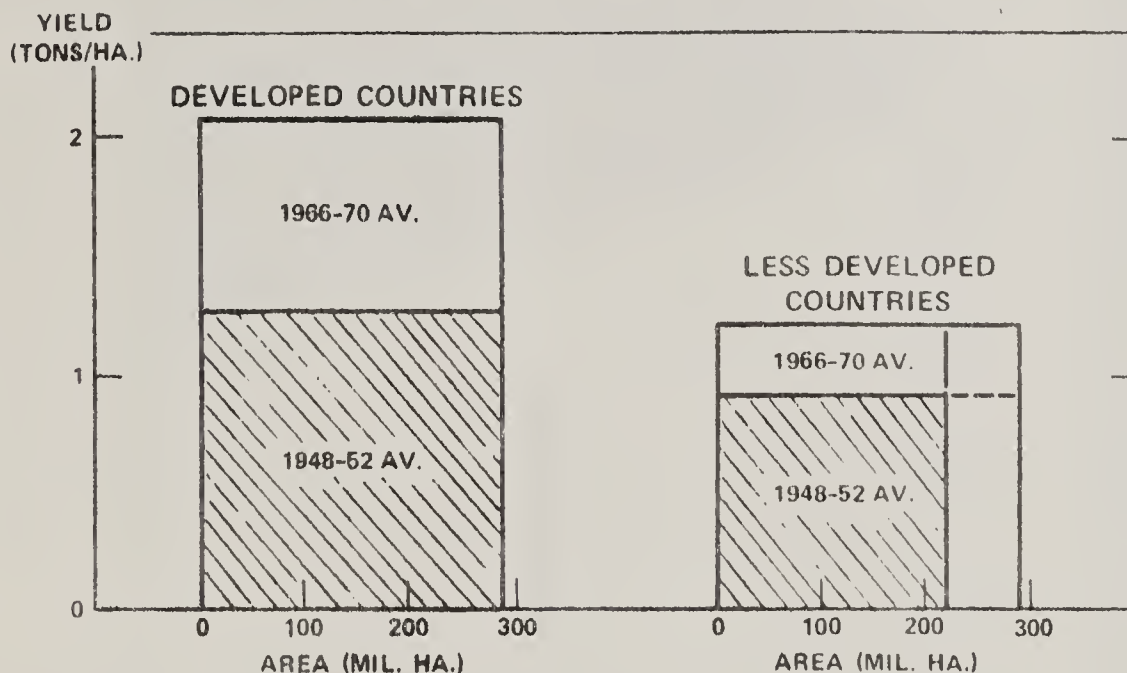
*Population excludes Communist Asia

In this chart the area of each rectangle, determined as the product of population (measured on the horizontal axis) times value of food production per capita (in dollars on the vertical axis), represents the total value of food production in million dollars for an indicated group of countries at a specified time. All four rectangles may be compared in height, in width, and in area. (Values computed at 1961-65 average prices.)

1. Developed countries in 1973 accounted for:
 - a. Two-fifths of world population
 - b. Three-fourths of world food production
 - c. Three-fourths of the increase in world food production since 1954
 - d. One-fourth of the increase in world population since 1954
2. From 1954 to 1973, the developed countries:
 - a. Increased population one-fourth, reaching 1,100 million, about equal to population in the LDC's in 1954, whose populations increased 60 percent by 1973.
 - b. Increased food production per capita one-third, reaching \$139 per person, more than 5 times the level of the LDC's.
 - c. Increased total food production two-thirds, to \$150 billion, more than 3 times that of the LDC's.
3. In the LDC's:
 - a. Food production per capita increased only 5 percent.
 - b. Aggregate food production rose two-thirds by 1973, to total little more than half that of the DC's 20 years earlier.

FIGURE C

ALL GRAINS: AREA, YIELD, AND PRODUCTION



In this chart the area of each rectangle, determined as the product of the amount of land in grains (in million hectares on the horizontal axis) times yield per hectare (in kilograms on the vertical scale), represents the total production of grains in million tons for an indicated group of countries at a specified time. All four rectangles may be compared in height, in width, and in area.

1. Developed countries in 1966-70 accounted for:
 - a. 50 percent of area in grains
 - b. 65 percent of world grain production
 - c. 61 percent of the increase in grain production over the 1948-52 average
 - d. None of the increase in world grain area
2. From 1948-52 to 1966-70 the LDC's:
 - a. Increased grain area 35 percent, reaching nearly 300 million hectares, thereby catching up with area in developed countries, which made no gain over this period.
 - b. Increased grain yields 32 percent, to 1.2 tons per hectare, nearly equal to developed countries' 1948-52 yields which increased 63 percent by 1966-70.
 - c. Increased grain production 78 percent to 356 million tons, nearly equal to the developed countries' 1948-52 production, which increased 64 percent by 1966-70.

The increase in production in the LDC's was 156 million tons:

- 45 percent from increased area
- 41 percent from increased yields
- 14 percent from combined effect of increased area and yields

FIGURE D

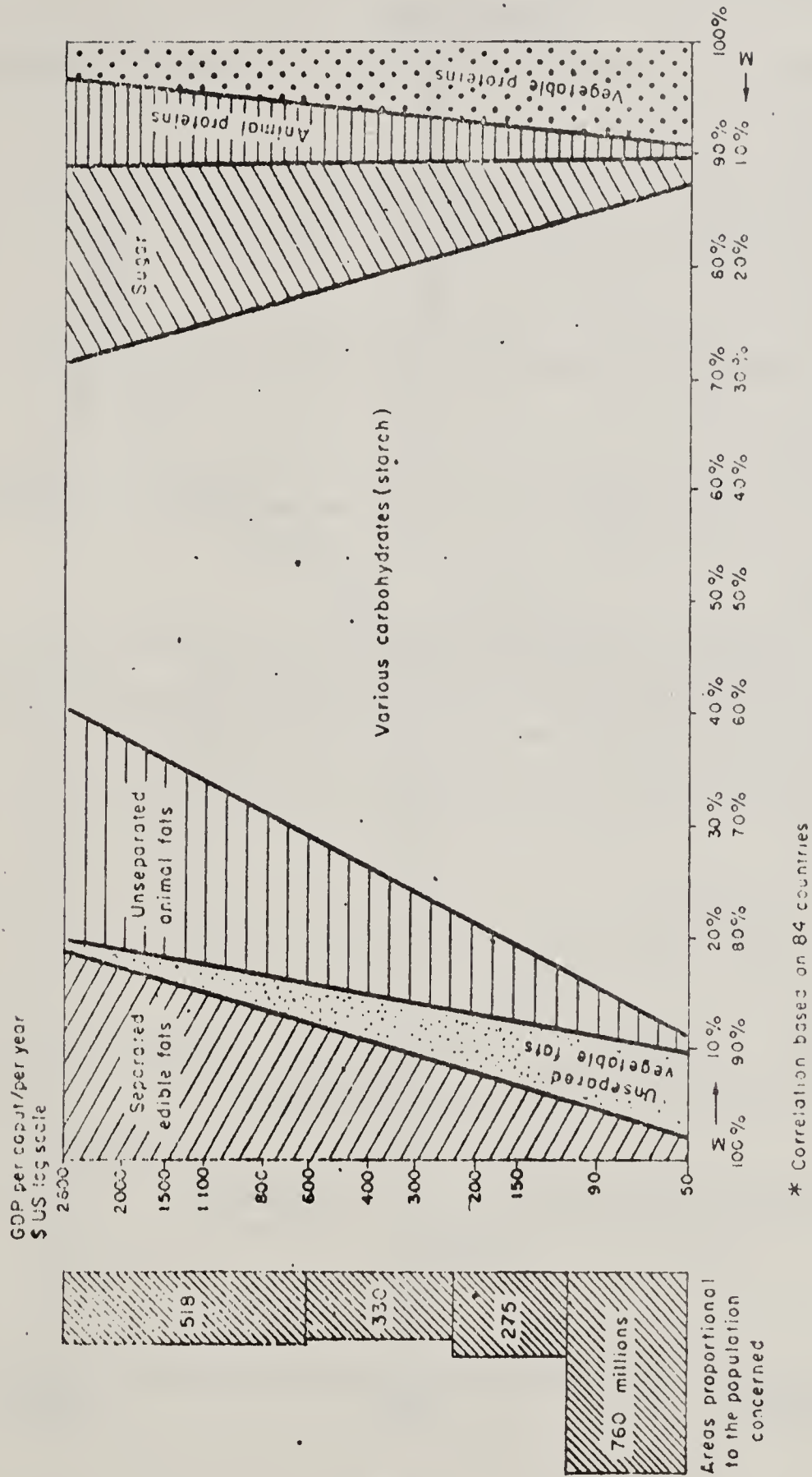


Figure E. Calories derived from fats, carbohydrates, proteins as percent of total calories according to the income of the countries (1962)

Source: United Nations, Food and Agriculture Organization. Provisional Indicative World Plan for Agricultural Development, August 1969, p. 501.

WORLD EXPORT UNIT PRICES-SELECTED COMMODITIES 1948-1973

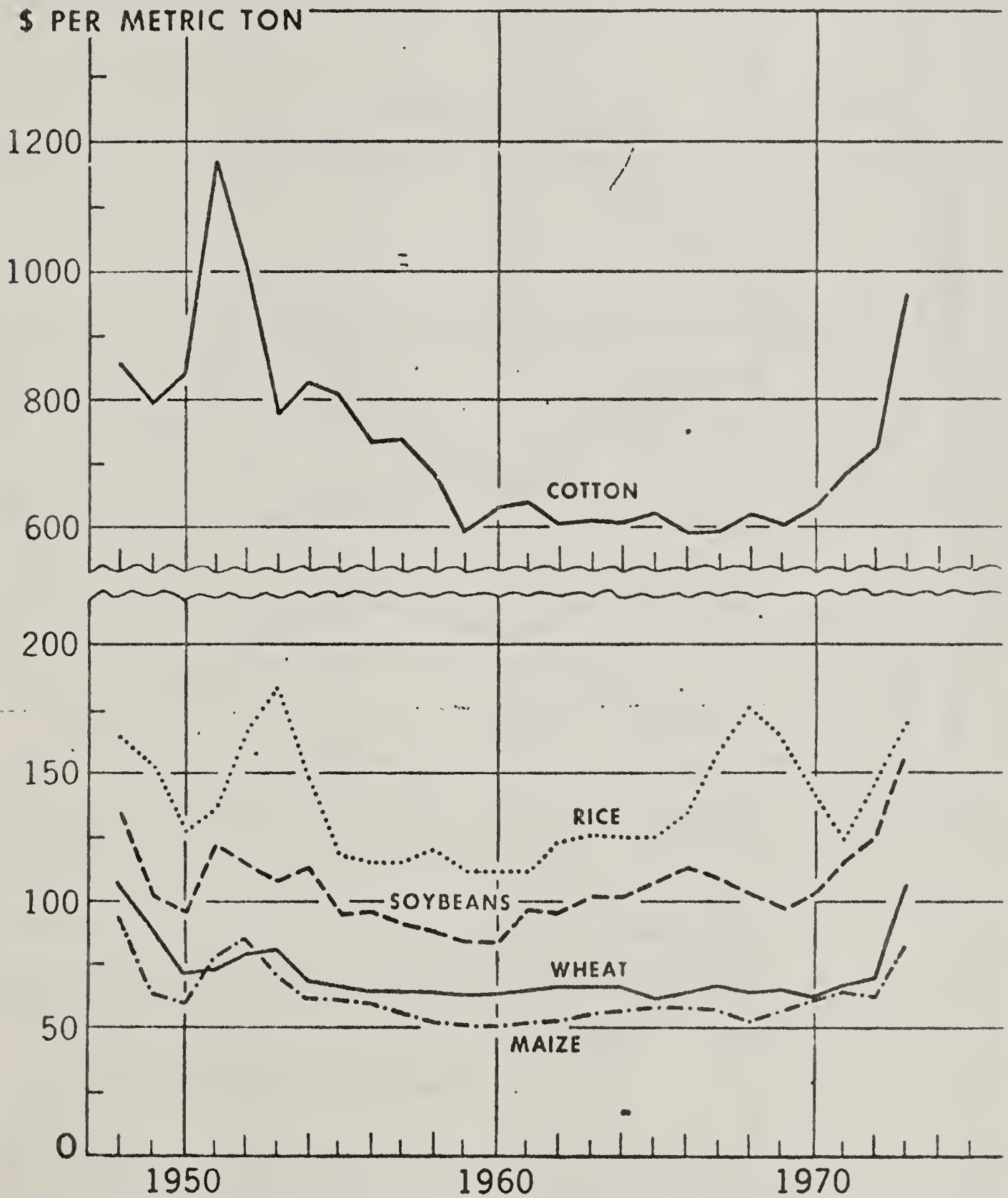
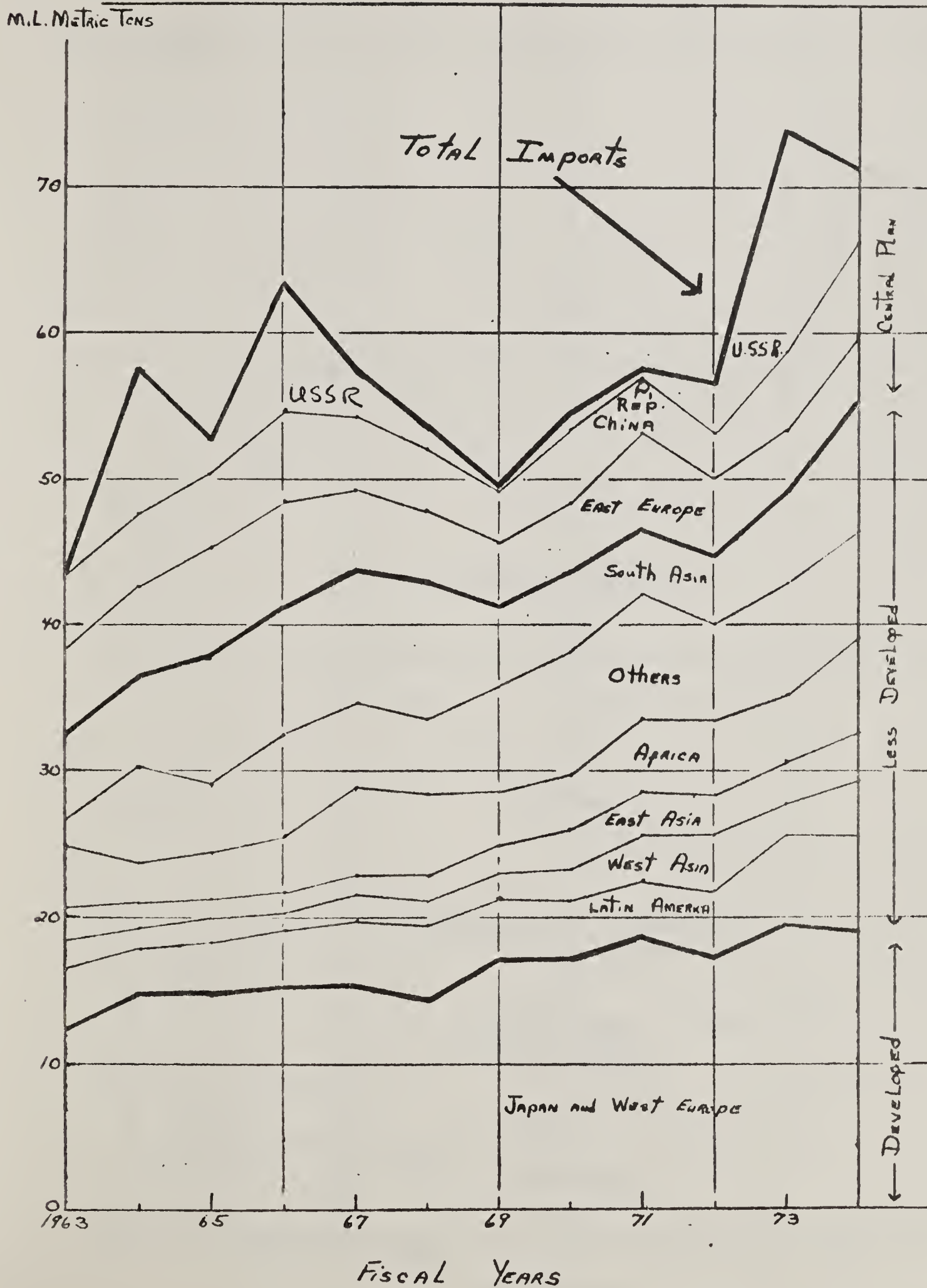


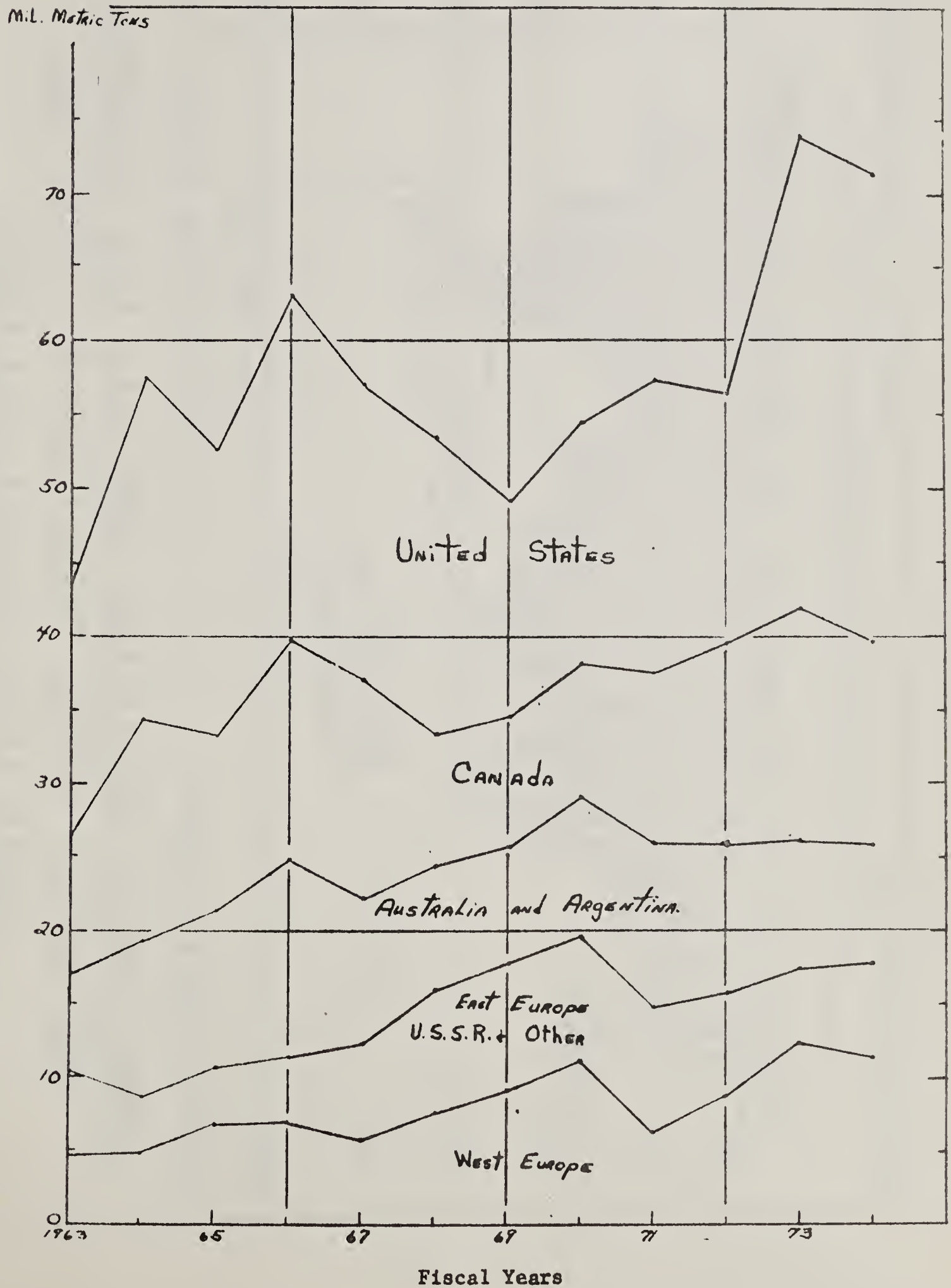
Figure F

Figure G
World Imports of Wheat and Flour (Grain Equivalent)
Fiscal Years 1963-1974*



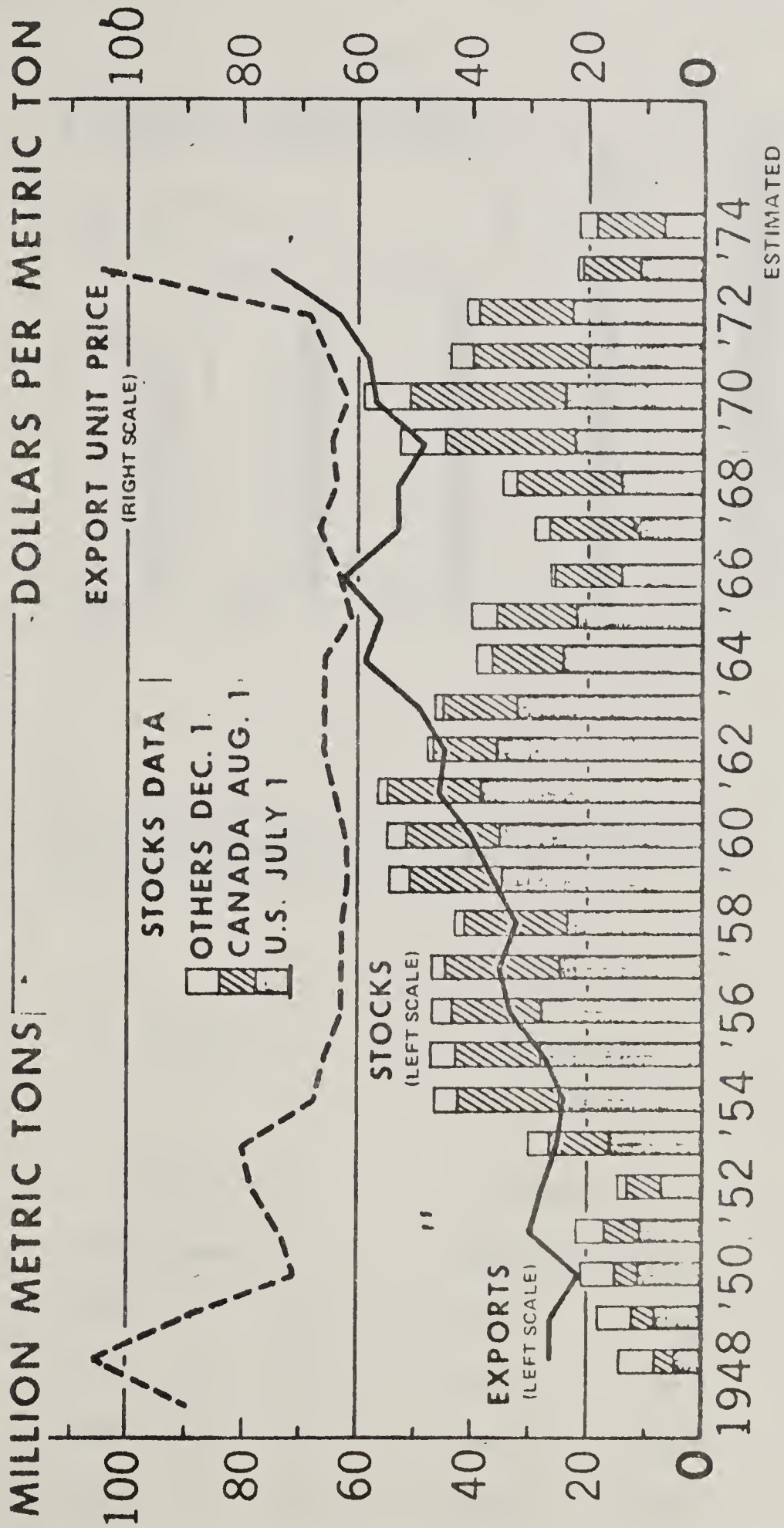
* Projected 1974

World Exports of Wheat and Flour (Grain Equivalent)
Fiscal Years 1963-1974*



* Projected 1974

WORLD TRADE EXPORT UNIT PRICE AND STOCKS (MAJOR EXPORTERS) OF WHEAT AND FLOUR (WHEAT EQUIVALENT) 1948-1973, 1974 ESTIMATE

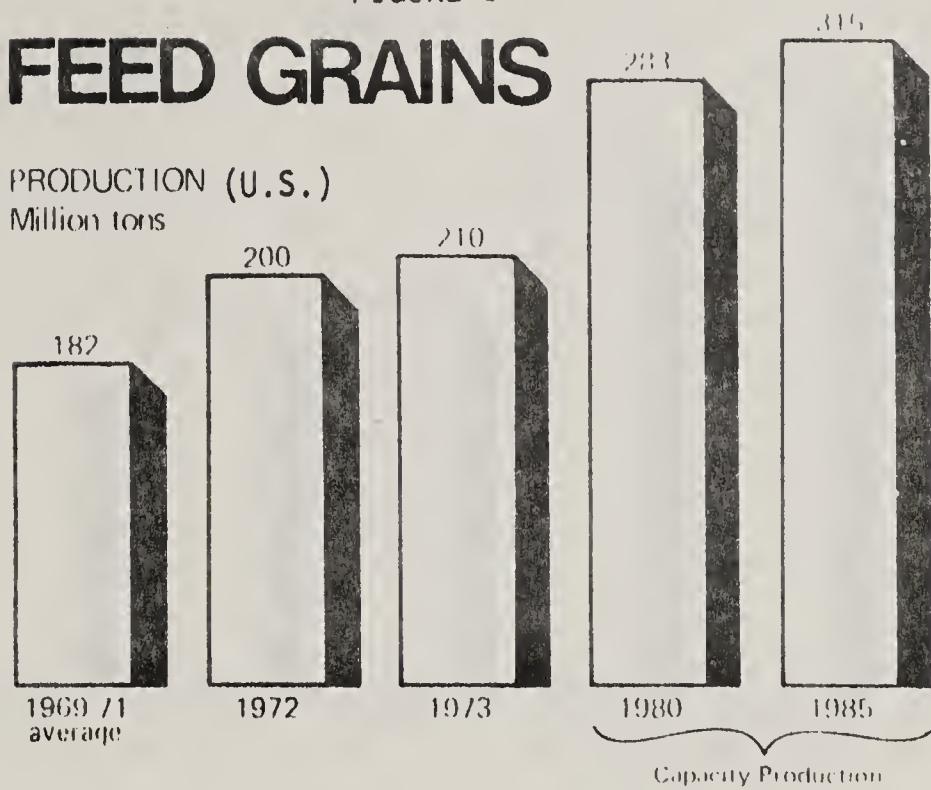


SOURCE: FAO STATE OF FOOD AND AGRICULTURE 1973, 1967.
WHEAT SITUATION, WS 226 ECONOMIC RESEARCH SERVICE, U.S.D.A., NOV. 1973.

FIGURE J

FEED GRAINS

PRODUCTION (U.S.)
Million tons



Feed grains, piling up acreage and yield increases, will continue to set production records. Total output in 1985 may soar 50 percent over 1973.

YIELDS

ACREAGE

Tons per acre

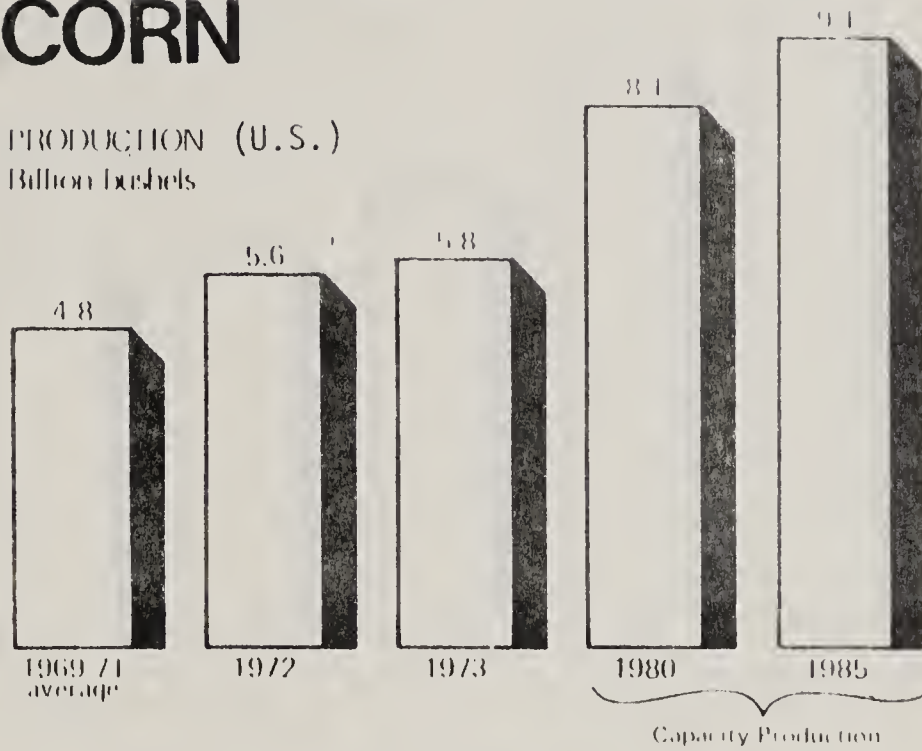
Million acres

1969-71 average	1.81	1969-71 average	100.4
1972	2.13	1972	94.1
1973	2.05	1973	102.4
1980	2.47	1980	114.7
1985	2.72	1985	115.7

CORN

FIGURE K

PRODUCTION (U.S.)
Billion bushels



Corn crops may reach 9 billion bushels by the mid eighties, with much of the expansion in harvested acre age occurring outside the Corn Belt.

YIELDS

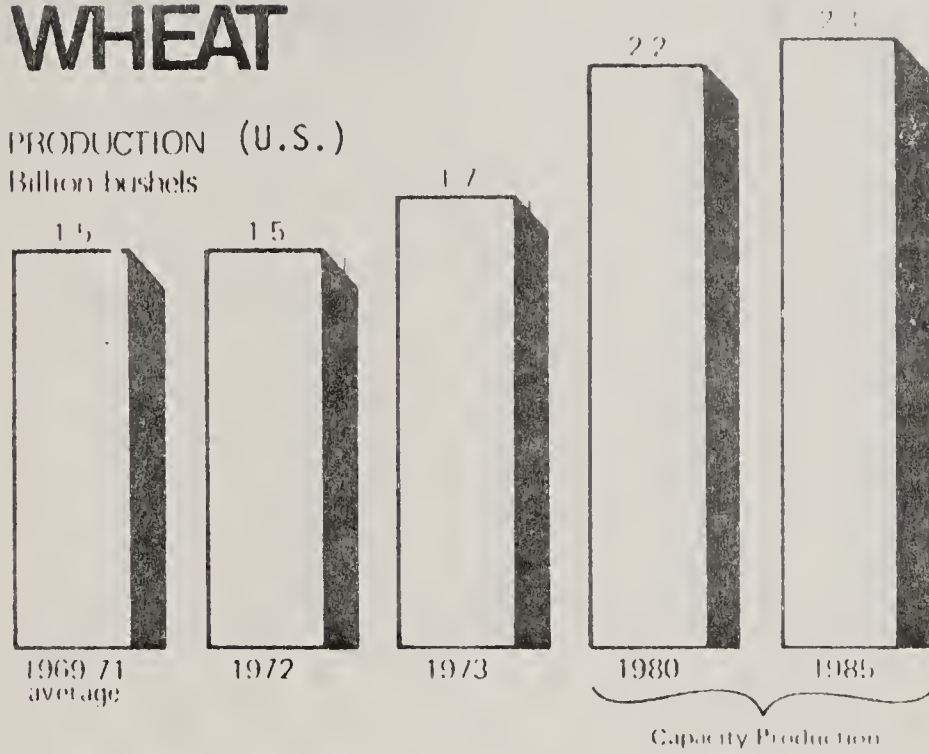
ACREAGE

Bushels per acre		Million acres	
1969-71 average	82.2	1969-71 average	58.7
1972	96.9	1972	57.3
1973	93.8	1973	61.5
1980	109.5	1980	73.7
1985	120.0	1985	75.5

FIGURE L

WHEAT

PRODUCTION (U.S.)
Billion bushels



Wheat harvests under all out production could surge 40 percent over the present mark. New hybrids only recently available stand to sharply boost average yields.

YIELDS

ACREAGE

Bushels per acre

Million acres

1969-71 average 31.9

1969-71 average 46.1

1972 32.7

1972 47.3

1973 32.2

1973 53.7

1980 34.5

1980 62.3

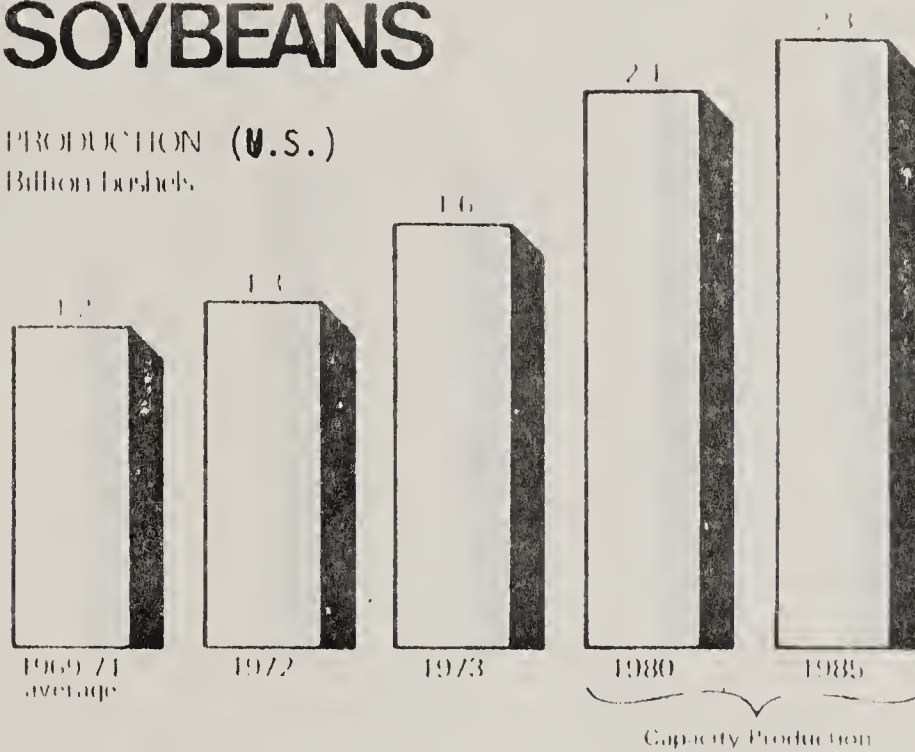
1985 36.6

1985 62.3

FIGURE M

SOYBEANS

PRODUCTION (U.S.)
Billion Bushels



Soybeans may take up some 65 million harvested acres of cropland by 1985, while output could post a one-third increase over current levels.

YIELDS

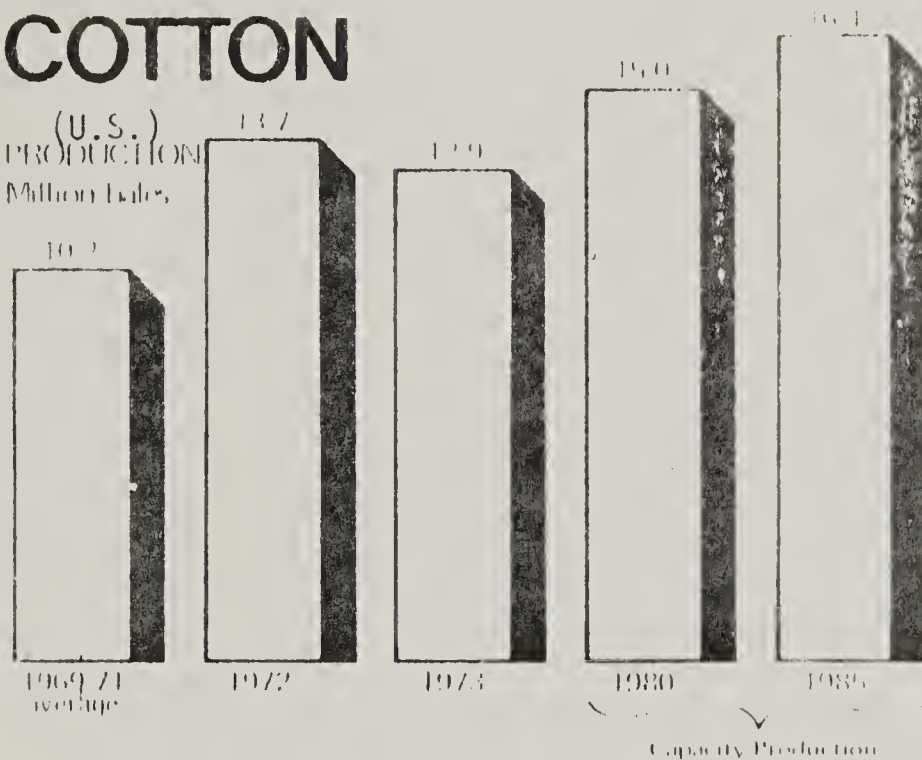
ACREAGE

Bushels per acre		Million acres	
1969-71 average	27.4	1969-71 average	42.1
1972	28.0	1972	45.8
1973	28.5	1973	56.2
1980	32.0	1980	64.1
1985	34.5	1985	65.7

FIGURE N

COTTON

(U.S.)
PRODUCTION
Million bales



Cotton production, in an about-face from its long decline, could register a 30-percent increase under full productive capacity.

YIELDS

ACREAGE

Pounds per acre

Million acres

1969-71 average 437

1969-71 average 11.2

1972 507

1972 13.2

1973 502

1973 12.4

1980 510

1980 14.1

1985 535

1985 14.7

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